STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Illinois Commerce Commission	)	
On Its Own Motion	)	
v.	)	
The Peoples Gas Light and	)	
Coke Company	)	Docket No. 16-0376
	)	
Investigation of the cost, scope, schedule	)	
and other issues related to the Peoples	)	
Gas Light and Coke Company's natural	)	
gas system modernization program and	)	
the establishment of Program policies and	)	
practices pursuant to Sections 8-501 and	)	
10-101 of the Public Utilities Act.	)	

REVISED DIRECT TESTIMONY OF

ALLEN R. NEALE

ON BEHALF OF

THE PEOPLE OF THE STATE OF ILLINOIS

AG Exhibit 1.0R

Originally filed October 11, 2016

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PUBLIC VERSION

CONFIDENTIAL INFORMATION HAS BEEN REDACTED PER DIRECTION OF THE COMPANY.

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I. QUALIFICATIONS AND SUMMARY OF TESTIMONY

Q. Mr. Neale, please identify yourself for the record.

A. My name is Allen R. Neale. I am a Consultant working in conjunction with Daymark Energy Advisors ("Daymark"). My business address is Allen R. Neale c/o Daymark Energy Advisors, One Washington Mall, 9th Floor, Boston, MA 02108.

Q. On whose behalf are you testifying in this proceeding?

A. I am submitting testimony on behalf of the People of the State of Illinois, through the Illinois Office of the Attorney General ("AG" or "the People") on the August 19, 2016 filing by The Peoples Gas Light and Coke Company ("PGL," "Peoples Gas," or the "Company") with the Illinois Commerce Commission (the "ICC" or "Commission") regarding the investigation of the cost, scope, schedule and other issues related to the PGL's natural gas system modernization program and the establishment of program policies and practices.

Q. Please describe your educational background.

A. I received a Master's of Business Administration from Southern New Hampshire College. I also have a Bachelor of Science in Engineering Technology in Mechanical Engineering from Wentworth Institute.

Q. Please summarize your experience and qualifications.

A. I have over 25 years of experience in the natural gas distribution business in Massachusetts. In 1973, I joined Essex County Gas Company (then Haverhill Gas) as a Junior Engineer and subsequently held the following positions: Corrosion Engineer; Supervisor of Distribution; Administrative Assistant; Vice President of Engineering, Meter Shop and Production; and finally, Vice President of Gas Supply, Planning, Rates, Regulatory, and Environmental Matters. As these various job titles indicate, I have a broad range of experience at various levels within a gas distribution company, including field work as a distribution system corrosion engineer and as a supervisor of distribution

overseeing main and service repair, replacement and new installations. Later, I was in charge of Department of Transportation and Massachusetts Department of Public Utilities Annual Reports for the company. My years as a Vice President provided substantial management and executive decision making experience as well as involvement in rates and regulatory affairs. In 1999, following regulatory approval of the merger involving the Essex and the Boston Gas Companies, I became the President of ARN Enterprises which owned and operated CRW Finishing Company, a metal finishing business. A copy of my resume is attached as AG Exhibit 1.1.

Q. Have you testified before the Commission?

A. No. However, I have offered testimony before other regulatory commissions on gas distribution company accelerated capital replacement plans in numerous proceedings. Recently, I testified in several cases before the Maryland Public Service Commission, including: (1) Case No. 9335 where the Washington Gas Light Company filed an application for approval to implement a Strategic Infrastructure Development and Enhancement Plan ("STRIDE") and an associated cost recovery mechanism; (2) Case No. 9332 where Columbia Gas of Maryland filed an application for approval of a STRIDE capital plan and rider; (3) Case No. 9417 where Columbia Gas of Maryland filed an application for approval to increase rates and charges, and (4) Case No. 9331 where Baltimore Gas and Electric Company filed an application for approval of its proposed first amendment under the Maryland STRIDE law and accompanying cost recovery mechanism. In Massachusetts, I submitted testimony on Gas System Enhancement Plans in six separate proceedings initiated by Massachusetts gas distribution companies for review of accelerated replacement of targeted leak-prone system components.

I have also testified on numerous occasions before the Massachusetts Department of Public Utilities during my tenure as an executive of the Essex Gas Company and more recently in my capacity as a consultant.

Q. What is the purpose of your testimony here?

A. I was asked by the AG to review and provide comment on the capital replacement program submitted by Peoples Gas for approval in this docket. My testimony should be construed as complementary to that of AG witness, Sebastian Coppola, who is submitting direct testimony on cost recovery and customer affordability issues, numbered as AG Exhibit 2.0 *et seq*.

Q. What conclusions do you reach in your testimony?

A. Based on my review and analysis to date, I conclude and recommend the following:

- The Commission should reject Peoples Gas's proposed System Modernization Plan ("SMP") and its "neighborhood approach" to replacing vulnerable cast iron and ductile iron ("CI/DI") mains from its distribution system. The Commission should order the Company immediately to reconfigure its program to focus more resources on the worst-performing segments first with the goal of achieving greater levels of system risk reduction. This goal should be achievable with lower annual costs than the Company's proposed SMP. The Company should refile this proposal with the Commission as a compliance filing in this docket.
- The Company should focus its accelerated infrastructure replacement program on replacing the riskiest or worst leak-prone pipe segments first. This methodology would be consistent with the risk reduction goals of the Distribution Integrity Management Program ("DIMP") mandated by the Pipeline and Hazardous Materials Safety Administration ("PHMSA") of the United States Department of Transportation.
- Continuing to follow PGL's existing "neighborhood approach" will not properly prioritize ridding the system of the riskiest or worst pipe segments. Peoples Gas's infrastructure replacement program should focus on replacing the riskiest or worst leak-prone pipe first, not replacing an entire neighborhood that may only contain some of the worst leak-prone pipe.
- The main priority of the Company's accelerated capital replacement activities should be to devote additional resources to replacing the riskiest or worst leak-prone pipe first. Secondarily, the Company should focus on coordinating with the City of Chicago (the "City") to ensure that the gas infrastructure is replaced in the

streets that the City or another utility is going to do work in, to take advantage of project efficiencies. Lastly, the Company may then focus on reconfigured modernization plan activities not otherwise addressed, but only when the leak rate is sufficiently controlled.[1]

- The Company should monitor and report annually to the Commission and interested stakeholders the following, complete with supporting data:
  - Its leak rate per mile on CI/DI mains separated by leak grade and pipe diameter;
  - The frequency and number of each type of leak survey performed, numbers of leaks found by each type of survey by neighborhood, and the neighborhoods covered; and
  - The number of leaks called in by the public by neighborhood separated by leak classification;
- When the leak rate and number of leaks the Company is experiencing each year is considered manageable, the Company should throttle back on the pace of the accelerated pipe replacement program to limit costs to ratepayers where minimal or no reduction in risk will be achieved for additional dollars spent in a year. A "manageable" level would be considered leak rates that are decreased to levels that could be safely and efficiently remedied by the Company's complement of repair crews that were kept on hand for this purpose before the implementation of the accelerated program in 2011. This refocused approach should produce customer bills that are more affordable to customers and a distribution system with increased public safety.
- The replacement rate of any replacement program should be more evenly paced in accordance with leak performance data, to avoid unnecessary "lumpiness" of investments which would place future customers or the Company in jeopardy of repeating an accelerated replacement program when the end of the useful life of the new generation of infrastructure currently being installed draws near.
- The Company should develop a metric for the evaluation of system risk reduction

[1] Consistent with Mr. Coppola's proposals, any such system modernization investments should be made at levels that ensure the greatest number of Peoples Gas customers are able to afford essential natural gas service.

per dollar spent on system replacement projects and submit it to the Commission for review and incorporation in the evaluation of the scope of any approved capital program. The selection of infrastructure replacement projects in any given year should seek to maximize the reduction of risk per dollars of investment.

- PGL should conduct a request for proposals ("RFP") to at least three commercial developers of software-based, system-wide risk assessment models for gas companies, score and select the models, and promptly implement a state-of-the-art software tool to better inform its risk based asset replacement decisions. The Company should complete the RFP process within 90 days of a Commission order in this proceeding.
- The Company should report its selection of software vendor and software package selected, along with a timeline for full implementation, to the Commission. Full implementation should take place within 180 days of selection of the vendor and new software package.
- Finally, the Company should be coordinating cost classification between base rate activities and Qualifying Infrastructure Plant ("QIP") projects to ensure least-cost infrastructure replacements. The Company should not use unit of property accounting or crew deployments to increase customer costs without an accompanying increase to plant in service and/or system repair activity.

II. INTRODUCTION

Q. Have you reviewed the Company's filing and all discovery in this proceeding?

A. Yes. I reviewed the initial testimony and accompanying exhibits filed by the Company, as well as PGL data request responses to the AG, the Commission Staff ("Staff"), the City, the Citizens Utility Board, and the Utility Workers Union Local 18007.

Q. Can you summarize the Company's August 19, 2016 filing?

A. Yes. PGL witness Andrew J. Hesselbach lays out the Company's plan for implementing a special capital program for what he refers to as the SMP, which is described as

including its previous main replacement program, the accelerated main replacement program ("AMRP"), and other system improvement projects.[2] Mr. Hesselbach discusses the SMP's purpose and scope, the Company's new approach to implementing the SMP through three-year rolling plans, the plan's delivery of value to customers through risk reduction, current Commission oversight measures that are in place for reviewing and analyzing the SMP work, and the Company's efforts to work with the City, the Company's workforce, and its customers.[3]

In addition to testimony, Mr. Hesselbach provided three exhibits that include maps of leaks in three neighborhoods before and after SMP implementation, the approach and methodology behind the Company's three-year rolling SMP plan, and a bill impact analysis for the average residential customer.

Q. Please explain the Company's proposed SMP.

A. According to the Company, the existing replacement program that was in place prior to Wisconsin Energy Company's ("WEC") acquisition[4] of Integrys Energy Group, Inc. ("Integrys") was reviewed by new management and a new multi-year systematic approach was initiated to prioritize work based on an analysis of the system components that were most at risk that were determined through monitoring and ranking of the system.[5]

PGL's proposed SMP includes four categories of investments:

- Neighborhood Replacement Program;
- Public Improvement/System Improvement Replacement Program;
- High Pressure Installation Program; and
- Transmission upgrades that include future PHMSA requirements like Calumet

[2] PGL Exhibit 1.0 at 3, Footnote 1.
[3] *Id*. at 3-4.
[4] WEC (now known as WEC Energy Group, Inc.) acquired PGL's former parent company, Integrys (which has been succeeded by Integrys Holding, Inc.) on June 29, 2015. The ICC approved that transaction in Docket No. 14-0496 on June 24, 2015.
[5] PGL Exhibit 1.0 at 13.

pipelines 2 and 3.[6]

The investments in the proposed SMP increase the SMP's scope of work over the Company's original AMRP, since the new program simply includes more categories of plant identified in the QIP categories that are authorized under Section 9-220.3 of the Public Utilities Act (the "Act"), which I have been advised governs how the Company recovers the return on and of capital that it invested under the QIP categories.[7]

The Company proposes to implement the SMP and its proposed investments on a rolling three-year basis with annual updates providing the expected scope of work for the next three years. PGL believes that "most of the risk components of our system [are] targeted for action."[8] The three-year rolling plan was originally proposed in the Company's November 30, 2015 compliance filing[9] for the period of 2016-2018.[10] The Company is proposing a target end date for the SMP set between 2035 and 2040 based on its anticipated pace of work, ability to coordinate with schedules of stakeholders like the City, and future PHMSA requirements that could affect the SMP.[11]

The Company expects to measure performance under the SMP through the tracking of what it believes are key metrics in internal and external reports. Performance reports will be presented to the Commission in the form of a mid-year and an annual report. The mid-year report will focus on how the Company is doing compared to its goals set for the then-current year. The annual report will compare what the Company did in the previous year to its goals for that year and provide expectations for investment projects in the upcoming year.

Q. Please describe the Company's Neighborhood Replacement Program.

[6] *Id*. at 15.
[7] *Id*. at 14-15.
[8] *Id*. at 18.
[9] This was part of the acquisition Docket No. 14-0496.
[10] PGL Exhibit 1.0 at 19.
[11] *Id*. at 20. The Company stated that a study by Kiefner and Associates, Inc. in March of 2007 was also a basis for determining the target end date of the SMP.

A. The Company states that the Neighborhood Replacement Program is aimed at retiring and replacing leak-prone natural gas facilities based on a risk-ranked approach. In addition, the program includes upgrading the distribution system from low pressure to medium pressure and relocating customers' meters outside.[12] The ranking system itself was developed by the Company and several factors used to develop a neighborhood score, including the Uniform Main Ranking Index ("UMRI").[13] Rather than rely on the UMRI to target risky segments, the Company has added several other variables to the UMRI score to produce its new approach, such as the amount of medium pressure cast iron pipe, pipe diameters below 8", leak backlogs on mains, the statistical mean (or average) Main Ranking Index ("MRI") – which is the unrounded UMRI score – and percentage of "vulnerable" services.[14] According to Mr. Hesselbach, the rankings are based on factors from the Company's DIMP.[15]

Q. Please explain UMRI and how it is used in Peoples Gas' neighborhood ranking system.

A. As explained in the filing, the UMRI is a scoring system that the Company developed and has been utilizing since 1990 to determine the pipe segments in the system that are most likely to fail and should be replaced. The UMRI uses historical information collected on the pipe segments in the system to develop an index factor based on historical performance indicators of each pipe segment. These performance indicators track "historical information, cracks, breaks, observations made on the pipe and repairs made on the pipe".[16]

In addition to these factors, the Company prioritizes replacement of neighborhoods by considering "constructability, the relationship of a given neighborhood to previous work performed and impacts from other known construction activities."[17] The scheduling of

[12] *Id*. at 16.
[13] *Id*. at 21.
[14] PGL response to data requests AG 4.05(c) & (d). All non-confidential references to data responses in my testimony have been compiled and attached in AG Exhibit 1.3 in numerical order by party issuing the request.
[15] PGL Exhibit 1.0 at 22.
[16] *Id.*
[17] *Id*. at 22-23.

neighborhood projects under the SMP can change, and is not just reliant on the neighborhood ranking system the Company uses to prioritize neighborhood replacements. Coordination with City departments and other system needs that arise, *i.e.* installation of high pressure main, can alter placement in the queue. Finally, each year the neighborhoods are re-evaluated and ranked, and based on engineering recommendations can move up or down on the rolling three-year plan priority list.

Q. How are the boundaries of the "neighborhoods" in the neighborhood ranking system defined?

A. The Company states that "the neighborhood boundaries are created using the City neighborhood boundaries."[18]

Q. Please describe the Company's other infrastructure replacement programs.

A. The Public Improvement/System Improvement Program includes similar projects to the Neighborhood Replacement Program, however, the Company does these projects based on third-party requests to relocate or replace facilities that conflict with public improvement projects or addresses a reliability or capacity concern on the system.[19] The High Pressure Installation Program's projects are investments needed to support the upgrading of lower pressure to medium pressure systems. In addition, these investments include "replacing stations, regulators, valves, and associated facilities to establish over-pressure protection."[20] The transmission upgrade program focuses on the replacement of natural gas transmission pipes.

Q. How has work on the new SMP progressed in 2016?

A. According to the Company, it has made strides in aligning its costs to be comparable to its peers. In addition, the work planned for 2016 is expected to be "substantially" completed by the end of the year and work for 2017 is expected to be started this year.[21] In regard to the expected investment budget for 2016, the Company has invested about

[18] PGL response to data request AG 4.05(e).
[19] PGL Exhibit 1.0 at p. 16.
[20] *Id*. at 17.
[21] *Id*. at 25.

"80% - 85% of the $250 million [it] budgeted [for the year]."[22] The current status of the work scheduled for 2016 through June of 2016 includes the retiring of 20.9 miles of main, while installing 16.6 miles of main, 1,381 services, and 7,628 meters.[23]

The leak rate performance of the Company since 2010 is depicted on page 27 of Mr. Hesselbech's testimony. According to the Company, the hazardous leak trend since 2010 has dropped over 20 percent.[24]

Q. **Please explain how the Company plans on recovering the costs of the SMP.**

A. PGL plans to recover costs of the SMP through Rider QIP and through general rate cases.[25] Section 9-220.3 of the Act authorizes a Rider QIP surcharge for certain infrastructure investment by natural gas distribution companies, which (as I am advised by counsel) the Commission specifically approved for PGL in Docket No. 13-0534. Whenever rate cases are filed by the Company, it will seek to include previously-incurred SMP capital costs in rate base and stop recovering those costs through the Rider QIP surcharge.[26] New QIP-qualified capital costs will then be recovered through the Rider QIP surcharge until the next general rate case.

It should be noted that the Rider QIP statute[27] states that it will expire after December 31, 2023. PGL stated in a discovery response that, if the Rider QIP law expires as scheduled, the Company will continue its planned SMP activities if it can obtain "appropriate cost recovery," possibly through "annual rate cases."[28]

III. BACKGROUND

A. The Accelerated Main Replacement Program

[22] *Id*.
[23] *Id*. at 26.
[24] *Id*.
[25] *Id*. at 28.
[26] *Id*.
[27] 220 ILCS 5/9-220.3.
[28] PGL response to data request AG 6.01(a).

Q. Please explain the AMRP and why it was created.

A. Peoples Gas first proposed the AMRP in its rate case in Docket Nos. 09-0166/0167 (consol.). The AMRP was developed in order to address leak-prone facilities. PGL presented testimony from an outside engineering consultant, Salvatore Marano, who proposed accelerating the Company's main replacement programs beyond the levels that had prevailed in previous years, moving to a targeted end date of 2030.[29] Mr. Marano testified that there are safety issues concerning CI/DI pipe and "there is a need to pursue a more accelerated approach of upgrading this system to prevent or mitigate foreseeable future risk of system and asset failure."[30] Mr. Marano also presented data purporting to show that the 2030 timeline would result in favorable cost-benefit balance compared to his two other suggested end dates of 2025 or 2035. In conjunction with this proposal, PGL also proposed an infrastructure cost recovery rider known as "Rider ICR." The Commission approved these proposals in an Order dated January 21, 2010. PGL began its AMRP activities in early 2011.

Q. Please explain the genesis of the Rider QIP statute.

A. I am advised by counsel that in September 2011, the Illinois Appellate Court struck down[31] Rider ICR in 2011. Around two years later, under the new Section 9-220.3 of the Act, enacted[32] in July 2013, the "Illinois legislature authorized expedited recovery from customers of costs incurred for the replacement, pressure-increase, and meter location work."[33] The recovery of costs was through a QIP surcharge.

Q. Can you explain the structure of the replacement program?

A. Peoples Gas's AMRP, which started in 2011, is largely focused on replacing CI/DI pipe that is high-risk and leak-prone, especially since the vintage of this pipe is very old. The replacement program was expected to span 20 years with an end date of 2030. Under the PGL AMRP, the Company planned to replace leak-prone pipe, increase system pressure,

[29] Docket No. 09-0167, PGL Ex. SDM-1.0 *et seq.*
[30] *Id*. at 2.
[31] *People ex rel. Madigan v. Illinois Commerce Comm'n*, 2011 IL App (1st) 100654, Sep. 30, 2011.
[32] Ill. Pub. Act. 98-0057 (July 5, 2013).
[33] The Liberty Consulting Group, Peoples Gas AMRP Investigation Phase One Final Report (May 5, 2015) at B-2.

and relocate customer meters. The AMRP was to consist of the following: installation of 3,056 miles of main, retirement of 2,028 miles of main, replacement of 296,391 services, replacement and/or relocation of 406,927 meters, installation of 63 miles of high pressure main, abandonment of 325 pressure regulator stations and installation of 51 new pressure regulator stations, and addition of two city gate stations.[34]

Q. What are the total estimated costs of the AMRP?

A. Mr. Marano estimated that the AMRP would cost $2.47 billion if completed by 2030. In 2012, Peoples Gas updated the AMRP cost estimate to $4.45.[35] In 2014, under its former parent company, Integrys, Peoples Gas asked Jacobs Engineering ("Jacobs") to prepare a new cost estimate for the AMRP. Jacobs' report showed that under a deterministic model, the estimated cost was $8.9 billion (for completion in 2032) to $9.2 billion (completion in 2043). Using a probabilistic model, the estimate ranged from $10.1 billion (completed in 2034) to $10.5 billion (completed in 2046).

Q. Have you reviewed any information regarding Peoples Gas's implementation of the AMRP?

A. Yes. In Docket Nos. 12-0511/0512 (cons.), the Commission directed that a two-part audit be conducted of the AMRP. Subsequently, the ICC retained The Liberty Consulting Group ("Liberty") to perform the audit. In its Phase One Final Report, Liberty found that since the program started, the "costs have been rising, work appears to have fallen behind the pace required to support 2030 completion, and leak rates have not fallen substantially, even though replacement of leak-prone pipe has accelerated."[36] Overall, Liberty found that management lacked an understanding of the total costs of the program, the duration of the program relative to its target completion date, and reasons why cast iron and ductile iron mains have not experienced a significant drop in leak rates

[34] *Id*. at B-2.
[35] *Id*.
[36] *Id*.

since the program began.[37] Liberty further found that major changes are needed to "optimize cost, schedule, and effectiveness" of the AMRP.[38]

Q. Does Mr. Hesselbach provide testimony regarding the recommendations included in Liberty's Phase One Final Report?

A. Yes. PGL reports that it is currently addressing other issues from the list of issues found by Liberty. The SMP proposed by the Company in its August 19, 2016 Filing is meant to further address the issues found by Liberty and the needs of the Company's natural gas distribution system.

Q. Does the Commission monitor the implementation of the Liberty recommendations?

A. Yes. Quarterly reports are submitted for the Commission to review. It is my understanding that in Liberty's Phase Two First Quarterly Report, the Commission's auditor expressed concerns regarding the then-recently divulged estimated cost of the AMRP. Liberty stated that it had recently learned of Jacobs' estimate that the AMRP would cost more than $8 billion.[39] Liberty concluded that while WEC insisted that Jacob's number was "'subject to check'", "continuing cost estimating work is not likely to generate an amount under $8 billion, and is more likely to produce a higher amount."[40] Liberty added that this dramatic new information as to the projected cost of the AMRP raised "profound questions about" many fundamental aspects of the AMRP.

Q. What is the Burns & McDonnell report?

A. In response to a directive in the Commission's Order in Docket No. 14-0496 (the merger proceeding) PGL retained Burns & McDonnell to "develop a cost forecast and schedule model the remaining accelerated infrastructure replacement program".[41] Among Burns & McDonnell's recommendations were:[42]

[37] *Id*. at ES-1.
[38] *Id*
[39] Liberty Phase Two First Quarterly Report at 4 (Sep. 30, 2015). All of Liberty's reports regarding the AMRP are available at https://www.icc.illinois.gov/NaturalGas/NaturalGasInvestigations.aspx.
[40] *Id*.
[41] Burns & McDonnell, Program Level Cost Forecast and Schedule Model (Nov. 30, 2015) at 4.
[42] *Id.* at 46.

1. Revisit the current model schedule with all stakeholders and confirm the 2016 schedule. - Engage all Departments involved in the AMRP and continuing to optimize the schedule sequences in the model. The current sequences were developed with high level information and needs additional review. The goal would be to have, at a minimum, a multiyear outlook so that design and coordination can recognize benefits from additional coordination, more accurate plans, more proactive public communication, and possible alternate contracting term and conditions.

2. Reduce the number of cost centers residing at the program level - Reduce the number of cost centers currently residing at the program level and insert them into the project level so that the true cost of each project (i.e. neighborhood) will be captured from concept to close out.

3. Engage all departments involved to optimize the schedule. Adopt a scheduling strategy that looks forward three to five years. – Engage all Departments involved in the AMRP and continue to optimize the schedule sequences in the model. The current sequences were developed with high level information and need additional review. The goal would be to have, at a minimum, a multiyear outlook so that design and coordination can recognize benefits from additional coordination, more accurate plans, more proactive public communication, and possible alternate contracting term and conditions.

4. Commit to truing up the model on a defined schedule.

5. Annually revisit all major cost centers budgets.

B. The Distribution Integrity Management Program

Q. Could you briefly describe the DIMP?

A. Yes. The DIMP is an integrity management program established by PHMSA in 2009 for gas distribution pipeline systems.[43] The federal Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006[44] directed PHMSA to create minimum standards for integrity management programs for gas distribution companies. Generally, PHMSA requires system operators in a plan to have:

1. Developed and demonstrated an understanding of the company's system;
2. Identified and considered threats to each gas distribution facility;
3. Completed a risk evaluation and ranking of their distribution system;

[43] 49 CFR Part 192, Subpart P.
[44] U.S. Pub. Law No. 109-468 (Dec. 29, 2006).

4. Developed criteria for deciding when risks require measures to reduce them;
5. Determined the measures to reduce risk;
6. Begun implementing the measures to reduce risk or have a plan to implement measures to reduce risk which includes an implementation schedule;
7. Assessed the effectiveness of their leak management program and taken steps, if necessary, to correct deficiencies;
8. Established a baseline measurement for each performance measure required by 49 CFR §§ 192.1007(e)(1)(i)-(v);
9. Developed performance measures to evaluate the effectiveness of measures to reduce risk, have a plan to collect the performance measure data, and begun collecting data to establish a baseline measurement;
10. Determined the appropriate period for conducting DIMP program evaluations;
11. Reported performance measures required by 49 CFR § 192.1007(g) for calendar year 2010;
12. Collected data as needed for mechanical fitting failures resulting in hazardous leaks beginning January 1, 2011; and
13. Identified records requiring retention and have maintained them.

Instead of imposing a one-size-fits-all specification for integrity management, PHMSA concluded that a requirement for operator-specific programs to manage pipeline system integrity would be more effective given the diversity in distribution systems and the threats facing them. PHMSA regulations guiding the program create a comprehensive framework and iterative process to assist with nuanced integrity management.

While the PHMSA regulations impose a management process, the regulations otherwise did not require any specific change to utility capital investment, operations or maintenance practices. System operators were given until August 2, 2011 to write and implement a program.

Q. Have you reviewed PGL's DIMP?

A. Yes, I have generally reviewed the Company's DIMP. The most recent version, which was revised January 31, 2016, was produced by the Company as AG 4.01 ATTACH 05.

Q. Could you briefly describe the purpose of the Company's DIMP Plan?

A. The Company's DIMP is necessary to meet the requirements of Federal Regulations 49 CFR Part 192, Subpart P: Gas Distribution Pipeline Integrity Management Program. PGL evaluates risk in its DIMP by first grouping facilities with similar issues, and then performs risk ranking. The Company develops and implements measures to address the risks that require attention.[45]

Q. Briefly describe how does PGL evaluates and ranks risk.

A. The Company states that it risk-ranks threats to its system by utilizing the output ranking from the Simple, Handy, Risk-based Integrity Management Plan ("SHRIMP") program along with validation from subject matter experts.[46] SHRIMP is an on-line tool that is used to create a written DIMP.[47] It provides "various leak data, risk ranking of threats, documentation of additional actions to reduce risk and the associated performance measures to evaluate effectiveness of the actions taken. The SHRIMP program also documents the implementation plan for the additional actions to reduce risk and the associated performance measures."[48]

Q. Does the Company's DIMP state any specific threats to the Company's system that are of major concern?

A. The DIMP describes threats to any distribution system in general, with some specific information about how Peoples Gas's system is affected by the list of threats from the PHMSA Form F7100-1.1 ("Form 7100").[49] The DIMP does not identify exact projects that the Company should undertake, but instead flags threat categories.

[45] PGL response to data request AG 4.01, Attach 05. The Peoples Gas Distribution Integrity Management Program, (revised January 31, 2016) at 4.
[46] *Id.* at 30.
[47] See http://apgasif.org/wp-content/uploads/2015/06/SHRIMP-Users-Guide-V2-1-7-_2_.pdf
[48] PGL response to data request AG 4.01, Attach 05 at 10.
[49] Form 7100 is the annual distribution system report required by PHMSA. http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/GD_Annual_Form_PHMSA_F7100_1_1_rev_5_2015.pdf

IV. ANALYSIS

A. The Leak Trend Has Worsened on the Company's System

Q. Explain how you began your data analysis of the performance of Company's system.

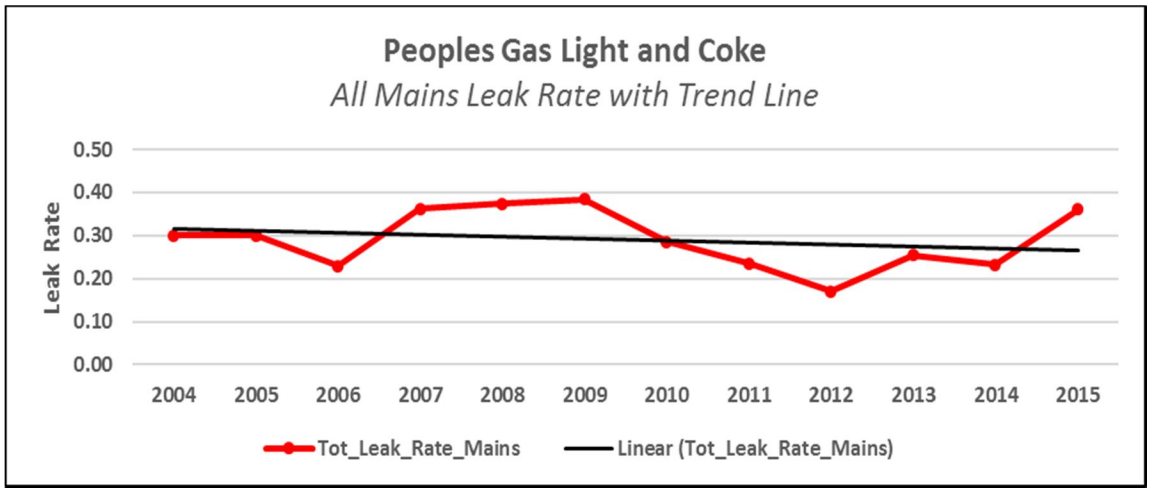
A. My analysis began by first analyzing PGL's PHMSA data, in addition to its DIMP data, provided by the Company in response to data request AG 4.01. The PHMSA data analysis consisted of analyzing miles of mains by material type, numbers of services by material type, system leaks by material type, hazardous leaks by material type, known system leaks, and lost and unaccounted-for gas trends by year for 2004 through 2015. Data from the Company was first compared to PHMSA data directly accessible from the Department of Transportation's website.[50] The PHMSA data allows for the review of the Company's actual field performance as reported to the federal government.

Q. What did you find from reviewing the Company's data on mains, services, leaks, and lost and unaccounted for gas?

A. I examined the Company's leak trends by miles of total main and number of total services. The leak rates, as shown in Figure 1 below, on all miles of main from 2004 through 2015 trended slightly negative during the time period.

Figure 1

[50] See: http://www.phmsa.dot.gov/portal/site/PHMSA/menuitem.6f23687cf7b00b0f22e4c6962d9c8789/?vgnextoid=a872dfa122a1d110VgnVCM1000009ed07898RCRD&vgnextchannel=3430fb649a2dc110VgnVCM1000009ed07898RCRD&vgnextfmt=print



Upon initial inspection, the figure would seem to show some improvement made by the Company or at least some success in maintaining the status quo.[51] However, as explained below, this is not necessarily the case.

The "leak rates" shown in the figure above are more accurately described as repair rates, since during this period the Company carried a leak backlog as well.[52] In addition, while the repair rate (red line with dots) has been increasing since just after the Company began its AMRP back in 2011, the overall leak rate trend (the black line) over time has remained relatively unchanged. This result may put into question the effectiveness of the initial AMRP and the changes made to the overall program after the change in Company management following the acquisition of Integrys by WEC.

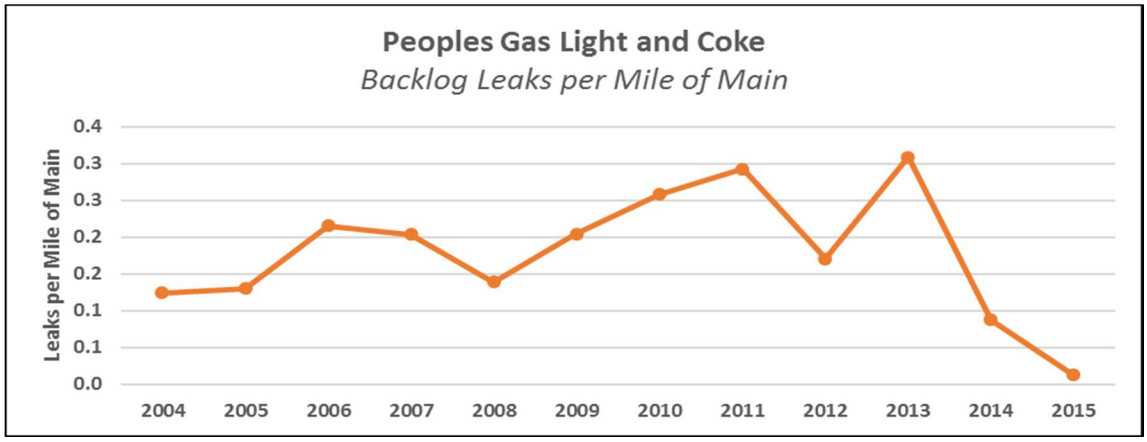
Q. What do you mean by your statement that Figure 1 shows a "repair rate" rather than a leak rate because of the backlog?

A. Using PHMSA data on leaks repaired and the inventory of miles of main, Figure 1 graphs the calculated ratios and trend line. This figure would provide an accurate system leak rate if all detected system leaks are repaired in the year when they become known, but that is often not the case. Some types of leaks can be deferred from the year discovered, sometimes for years, and repaired later. The Company's leak backlog can distort the leak

[51] The leaks used to calculate the leak rate in the figure exclude leaks caused by third-party damage.
[52] A leak backlog comprises those leaks in need of repair that remain unrepaired at the end of the year and carry over into the next.

rate due to the deferral of non-hazardous leaks in two ways. First, if a leak occurs but is not fixed in a given year, it results in the artificial suppression of leak rates in that year. Second, when the leak is repaired in the future, the population of leak-prone pipe will likely be smaller, either through normal replacement or through accelerated replacement, which will have the effect of increasing the perceived leak rate, if it is measured on specific main material types. As a result of the potential distortions, I next reviewed the Company's leak backlog by looking at remaining leaks at the end of each year per mile of main, as shown in the Figure 2 below.

Figure 2



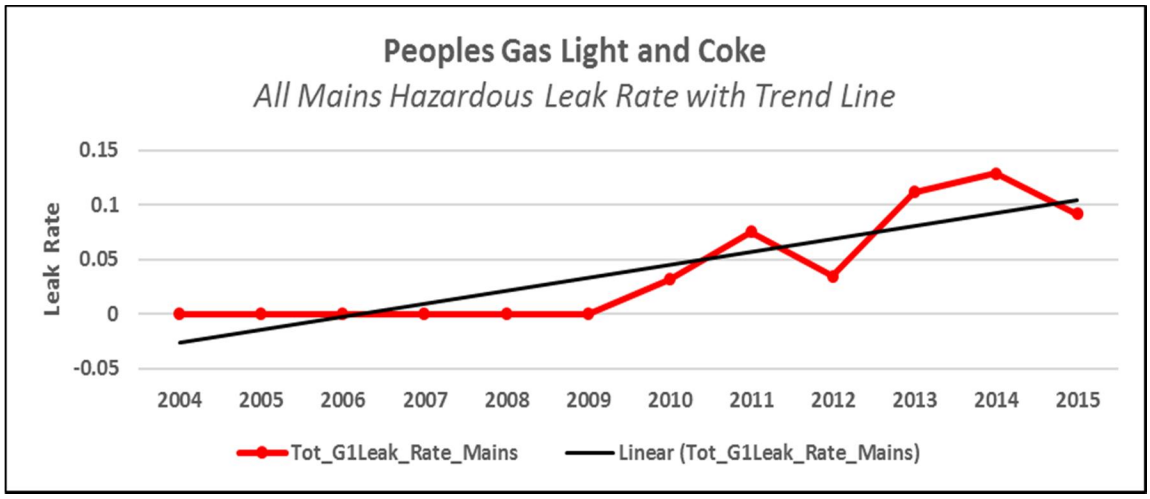
The leak backlog analysis indicates that the Company has been busy working off the leak backlog since the AMRP began in 2011. Before initiation of the AMRP, the leak backlog had been trending up, which would have had the effect of suppressing the "leak rate" calculated using the PHMSA leak repaired and main inventory data. The PHMSA data shows that as the Company is working off more of its leak backlog over the last five or so years, there are more repaired leaks being recorded in PHMSA reports, and so the repair rate is going up, as shown in years 2012 through 2015 in Figure 1. This dynamic makes it difficult to draw definitive conclusions about (1) whether the Company is making progress and (2) the performance and underlying health of the distribution system. Accordingly, I conducted a more granular analysis.

Q. How did you account for the influence of the leak backlog?

A. Since the Company had significant changes in its leak backlog, I focused on the most hazardous leaks on its system, Class 1 leaks. Leaks are categorized into three types,

Class 1, Class 2, or Class 3.[53] Class 1 leaks are the most hazardous and must be resolved promptly, and so cannot be deferred when found, unlike Class 2 or 3 leaks. It is reasonable to assume that analyzing leaks of this class repaired per mile of main will reveal an actual leak rate rather than simply a rate of repair work. In Figure 3 below, I provide a figure similar to Figure 1, but the difference is it shows the *hazardous* leak repaired rate across all mains instead of including all leaks.[54]

Figure 3



The trend line in this figure for the most dangerous types of leaks shows an increasing trend since 2004, and the rate takes an uptick after the AMRP began, followed by some leveling off starting in 2013. The trend is still upward. This figure indicates that the Company is still experiencing risky leak issues on its system. Since it's unlikely that leaks are occurring on its inventory of plastic mains, this trend probably indicates a problem with the Company's riskiest leak-prone pipe population. The upward trend reveals that the Company's programs in recent years have not been sufficiently structured to reduce the leak rate to levels experienced in the 2004 to 2009 timeframe. Since 2009, the rate of Class 1 leaks has been on the rise. This is troublesome considering the Company has been replacing leak-prone pipe in its system on a more accelerated basis. It is also troublesome because Peoples Gas still has a significant amount of at-risk pipe in

[53] The leak classification system for grading leaks by class is a well-established industry practice, and is a separate grading system from the MRI, which is a method used by the Company to identify the most vulnerable pipe segments on its system. Peoples Gas's MRI uses a different numbering system for identifying vulnerable pipes. Pipe segments are classified from 6 down to 1, with type 6 segments being the most risky.
[54] The leaks used to calculate the leak rate in the figure exclude leaks caused by third party damage.

its system. According to the PHMSA data at the end 2015, the miles of leak-prone main remaining on the Company's system is about 1,526 miles of cast iron and ductile iron, which represents about 35% of total mains. [55]

Q. Did you take further steps to analyze the leak rates on the Company's distribution system?

A. Yes. The next step in my analysis was to examine leak survey data in order to better understand the leaks encountered in the Company's system.

Q. Why is leak survey data probative?

A. The survey data should reveal the number of leaks discovered on the Company's system. Since these are leaks discovered, but not necessarily repaired, these figures should help provide annual leak ratios. The Company is required to survey its system on a periodic basis, but may conduct additional surveys. The frequency of the surveys and the areas of the system that are surveyed will affect the number of leaks discovered, as will the time of year a survey is conducted. Conducting more frequent surveys of areas of the system with known leak problems during a season where experience shows leaks are more prevalent will naturally yield more leaks discovered, but that does not necessarily mean there has been a dramatic change in the underlying health of the distribution system.[56] It just means efforts at detection have been stepped up, so it's important to take these factors into consideration when examining survey data. For example, if a utility were conducting more than the minimum number of leak surveys for a number of years, but then reverted to the minimum survey cycle, that decision would tend to put downward pressure on its leak rate, all else being equal. In other words, more leak surveys will result in finding more of the leaks that exist on the system while fewer leak surveys will mean less of those leaks are discovered. If a leak is not discovered, then it is very unlikely to be repaired.

[55] I also conducted a similar analysis of these leak groupings on the number of services. The trend in the hazardous leak repair rate for services since 2004 has been increasing, with 2004 – 2009 remaining generally constant, 2009 – 2012 increasing, and since 2012, slightly decreasing. The number of leak-prone services in the Company's system though is relatively low compared to the total services (about 17,618 leak-prone services out of about 513,850 total services or 3.4% of the total services).

[56] Of course, leaks can be discovered when a customer places a call to a company to report a suspected gas leak.

Q. Are leak surveys filed with PHMSA?

A. No, Peoples Gas was asked to provide information about its leak survey program in data request AG 4.12, parts (i), (j), and (k). In response, the Company stated "Peoples Gas objects to this request as asking it to create a study or analysis that does not exist."[57] The Company also pointed to its Excel data[58] that was used to create the "weather normalized" leak chart Figure 2 in Mr. Hesselbach's testimony as its response to part (i), which asked the Company to "discuss with reasonable specificity the company's leak survey program."

Since these responses were not satisfactory, additional data requests were asked of the Company in follow-up to its initial responses.[59] In data request AG 7.06, for example, PGL was asked to "state the number of each type of leak survey conducted in each year, 2010 through 2015, or else please explain in detail why PGL is not aware of when it conducted different leak surveys." In response, the Company stated: [60]

> Peoples Gas objects to this data request as overly broad and unduly burdensome with respect to its request for information from before 2015. Data for periods prior to 2015 has been archived and is therefore not readily accessible, and its retrieval and production would impose a significant burden on the company. Without waiving this objection or its General Objections, Peoples Gas responds as follows: Please refer to AG 7.07 Attach 01, for the detail of the number of miles, services and work requests that have been surveyed by type for 2015.

Again, the Company declined to provide information about its leak surveys, especially prior to 2015, where my analysis in Figures 2 and 3 show significant changes to leaks on the Company's system.

In data request AG 7.09, the Company was asked to "Please state the numbers of leaks found by year (2010-2015) for each leak survey type, or else please explain in detail why

[57] PGL response to data request AG 4.12 and AG 4.12 Supplement.
[58] PGL response to data request AG 4.12, Attach 01. PDF and Excel versions.
[59] See PGL responses to data requests AG 7.06, AG 7.07, AG 7.08, and AG 7.09.
[60] PGL response to data request AG 7.06.

PGL does not track the number of leaks found each time it conducts a leak survey." In response, the Company stated: "Peoples Gas does have historical data on leaks found by leak surveys; however, Peoples Gas does not, in the ordinary course of business, track the number of leaks found each year by leak survey type." The Company was again questioned about its leak detection protocols in data request AG 11.09. In its response, I was not able to discern how consistent the Company was in the percentage of its system being monitored through leak surveys.[61]

Q. Do Peoples Gas's responses to these data requests concern you?

A. Yes. It is troublesome that the Company apparently has some historical data on leaks found by leak surveys, but does not seem to have other information about how those leaks were found. The frequency of leak surveys will drive leaks discovered on the system, so claims of improved discovery of system wide leaks needs to be supported by a detailed disclosure of the number, frequency, area and results of those surveys over time. Here, the Company neither provided that information in its initial filing nor in response to a series of data requests.

Q. What did the Company say about its progress and performance with respect to leak rates?

A. The Company explained that it is doing well under its SMP, which includes its neighborhood approach to replacing leak-prone pipe. In Mr. Hesselbach's testimony, he states that "Peoples Gas' efforts to modernize its system have had a direct and positive effect on its leak rate performance. Since 2010, the trend in hazardous leaks has dropped by over 20 percent."[62] This statement and the accompanying figure seems to show a different result compared to the PHMSA analysis.

Q. Do you consider the Company's analysis of leaks on its system to adequately support the Mr. Hesselbach's testimony that leak performance has improved?

[61] PGL response to data request AG 11.09.
[62] PGL Exhibit 1.0 at 26:526-529.

A. Not fully. First, the Company has looked at leaks across its entire system, which while relevant from a high level, does not provide any insight into which system components may be contributing to leaks that are occurring. Since the Company is removing targeted classes of CI/DI pipes, one would expect the total number of leaks to decrease by dint of there being fewer of these types of segments in the system, all else being equal. A more relevant and important inquiry would be the leak rate per mile of main and trends on the remaining population of targeted (*i.e.*, at-risk) materials. If for example, the leak rate were increasing on the remaining populations of vulnerable main for Grade 1 leaks, but the total number of system leaks were decreasing, then the capital replacement program would need to be adjusted to devote more resources to address the segments contributing more heavily to the upward trend in the leak rate.

The Company's leak analysis, however, does not address the issue of leak rates by pipe material type, so it is insufficiently detailed to be useful to determine if its special capital programs have been effective at reducing the leak rates over the last few years. A gas distribution system is composed of various components and each needs to be monitored to determine its contribution to the overall health of the system. This observation is especially true of at-risk mains.

Second, the Company weather-normalized its leak data. The Company performed this adjustment to the data, it reasoned, to better compare different years on a like-for-like basis since colder weather could affect the number of leaks found on the system. The idea here is that cold weather sufficient to have frost penetration into the ground will contribute to leaks on main materials like cast iron. The Company uses heating degree days ("HDDs") to normalize the data.[63]

Q. Does PHMSA reporting require weather-normalization of leaks?

A. No. Leaks are reported as repaired with no adjustment for weather.

[63] PGL response to data request AG 4.12 (c).

Q. Are heating degree days a good proxy to weather normalize leaks?

A. No. Heating degree days throughout the year will not affect the generation of leaks on CI/DI pipes. Furthermore, heating degree days in periods other than the winter months have no real impact on leaks for cast iron or ductile iron pipes. Moreover, weather-normalizing leak data may decrease the reported number of leaks, thereby masking the true state of the system.

Q. Has the Company traditionally weather-normalized leaks with heating degree days?

A. No. The Company started the practice just last year.[64]

Q. Do you have any other observations about the Grade 1 & 2 Leaks 2010 – June 2016 chart (Figure 2) on page 27 of Mr. Hesselbach's testimony?

A. Yes. According to responses to discovery, the leaks in this chart are Grade 1 and 2 leaks discovered (not repaired).[65] As discussed above, the frequency and location of leak surveying will drive the number of leaks discovered. Without knowing more about the pattern of surveying on the Company's system during the study period, Figure 2 in Mr. Hesselbach's testimony is of limited usefulness.

***

BEGIN CONFIDENTIAL

Q [redacted]

A. [redacted]

END CONFIDENTIAL

[64] PGL response to data request AG 11.17 (d).
[65] PGL response to data request AG 4.12 (b).
[66] PGL responses to AG 11.10 to AG 11.15 (CONFIDENTIAL) attached hereto as AG Ex. 1.2.

[redacted]

[redacted]

[redacted]

***

END CONFIDENTIAL

Q. What is your impression of the Company's internal leak rate information?

A. The information reinforced my position with respect to the recommendations related to system performance and its relation to the proposed SMP.

Q. Did you look at any other indicators to evaluate leaks on the PGL's system?

A. Yes. Another way to examine the health of the Company's system would be to examine the amount of Unaccounted for Gas ("UG") on the system.

Q. What is UG?

A. Not all the gas that a company purchases for use by customers ends up getting delivered through the distribution system for a variety of factors, including changes in volume of gas from the temperature during injection and withdrawal, leaks, meter errors, and other factors. According to PHMSA reporting instructions, UG is defined as:[68]

> Unaccounted for gas" is gas lost; that is, gas that the operator cannot account for as usage or through appropriate adjustment. Adjustments are appropriately made for such factors as variations in temperature, pressure, meter-reading cycles, or heat content; calculable losses from construction, purging, line breaks, etc., where specific data are available to allow reasonable calculation or estimate; or other similar factors.

The PHMSA formula for calculating UG is written as:

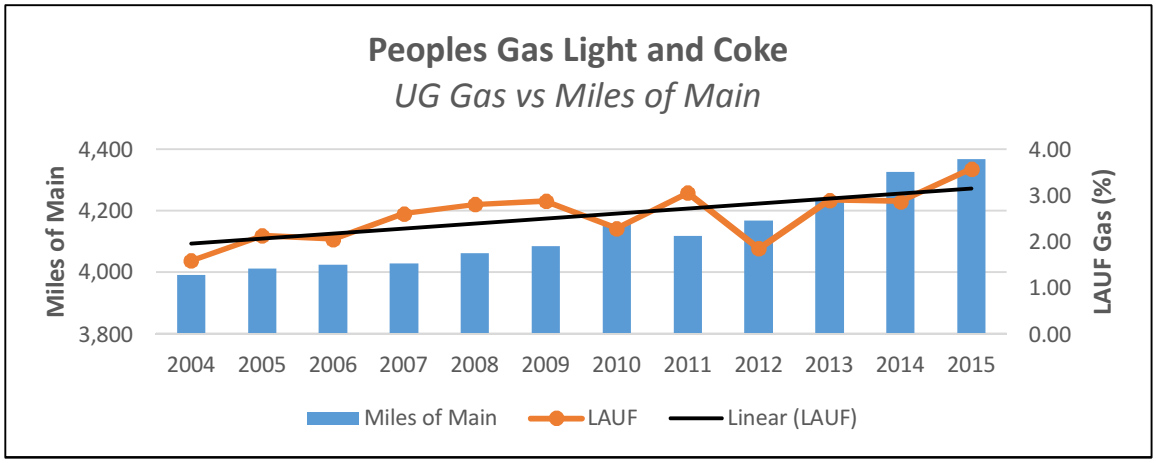
[(Purchased gas + produced gas) − (customer use + company use + appropriate adjustments)] / (purchased gas + produced gas) = % UG

Q. Did you review the UG for the Company?

A. Yes. Below is an analysis of the UG for the Company on a mile of main basis.

Figure 9

[68] http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/distr_ann_instructionsrevised.pdf.



Q. What does this chart tell you?

A. The amount of UG is up over the 10-year period, and the trend line is increasing as well. While UG is not a perfect measure for gas lost through leaks, the PHSMA reporting instructions require the Company to make adjustments in order to account for some of the variables that would affect this measure on the system, like purging of lines that may accompany replacement work. When viewed alongside the other leak information discussed in my testimony, the UG analysis supports the conclusion that leaks are becoming an increasing problem on the Company's system.

B. The DIMP Requires Risk Ranking of the Distribution System, Not "Neighborhood" Rankings

Q. Can you describe the Company's neighborhood approach in the SMP in more detail?

A. Yes. The neighborhood approach to targeting area-wide replacement consists a multi-factored test with specific definitions and weights, as follows:[69]

Factor	Definition	Weight in Index
% of CIDI Medium Pressure Pipe	"% of CIDI medium pressure pipe" is the amount of cast iron and ductile iron gas mains operating at medium	30%

[69] PGL response to data requests AG 4.05(c) & (d).

	pressure within that neighborhood divided by the total amount of low pressure gas main and medium pressure cast and ductile iron mains.	
% of CI Main <=8	"% of CI Main <=8" is the total amount of cast iron main that is 8 inch in diameter or smaller within that neighborhood, divided by the total amount of low pressure gas main and medium pressure cast and ductile iron mains.	15%
Mean MRI	"Mean MRI" is the statistical mean of all the segments of low pressure gas main and medium pressure cast and ductile iron gas mains within a neighborhood.	30%
% of Vulnerable Services	"% of Vulnerable services" is the number of service pipes made of vulnerable material types (cast iron, ductile iron, copper, clear plastic, baresteel) divided by the total number of service pipes to be replaced within that neighborhood.	15%
Total Pending Leaks (2 & 3) per mile of main	Total Pending Leaks (2 & 3) per mile of main" is the total number of pending leaks taken at the time of the annual model which are class 2 and 3 leaks, divided by the total amount of mains in the neighborhood.	10%

As is immediately apparent from reviewing the variables and weightings in the table above[70], the Company's main ranking index -- a formula based on performance data to identify risky mains – is not the sole or even predominant driver of ranking a

[70] PGL response to ENG 1.01 (Attachment 01).

neighborhood. At 30% weighing, this asset performance-based measure has an equal weighting to the operating pressure based metric (the % CIDI medium pressure metric)). In fact, the generally performance-based metrics (pending leaks and mean MRI) at a total of 40%, are weighted less than the system configuration measures (pipe pressure, pipe diameter, and service type) at 60% of the total possible score.

Additionally, even if the worst neighborhood for a particular metric scores twice as badly as the next-worst neighborhood in that metric (say, pending leaks per mile of main), its scaled score for that metric in the Neighborhood Ranking will be only 228, which is less than 1% greater than the next-worst neighborhood's scaled score (227) in that metric. Thus, the worst neighborhood's scaled score that enters into the overall weighted average Neighborhood Ranking will not reflect precisely how badly that neighborhood was doing in the metric.[71]

Q. Do you have any observations about this approach?

A. Yes. The impact of the performance metrics on selecting a neighborhood for area-wide replacement have been diluted by introduction of the other factors found on the distribution system, like the level of system pressure. This neighborhood approach is more geared to selecting areas in order to replace pipe to build a higher-pressure backbone delivery system than toward targeting the worse performing segments of the system for replacement. While there may be some project efficiencies to replacing all targeted mains and services in lower-pressure areas in order to enable higher-pressure build-out with more modern plastic materials, this goal should not come at the expense of devoting resources to removing the riskiest segments on the Company's system first. In other words, the neighborhood approach does not necessarily achieve the greatest risk reduction per dollar spent on the SMP.

[71] PGL response to data request AG 1.06, Attach 01.

Q Has the Company provided any analysis that supports the statement that there is a decrease in unit cost from a neighborhood approach and the amount of that reduction?

A. No.

Q. Has the Company provided any analysis that quantifies the amount of unit cost savings from the neighborhood approach compared to overall budget increases from replacing an entire neighborhood all at once?

A. No, and this analysis is critical from an affordability standpoint. The Company is spending a lot of money on bringing medium pressure distribution system in the neighborhoods which may have little to no immediate impact on replacing the riskiest pipe segments. The main purposes of such a costly program is convert a low pressure distribution system to a medium pressure system, rather than reduce risk. Low pressure distribution systems and have operated safety for a very long time in the industry, and there is no need to embark on a switch from low to medium pressure systems for its own sake.

Q. Does the DIMP require that Company rank its system by "neighborhoods"?

A. No. The DIMP regulations require that all components of a company's system be evaluated for risk, and there is no requirement that neighborhoods be profiled in the way the Peoples Gas has proposed. The DIMP should be focused on reducing risk, not reducing costs. The Company cannot substitute what it believes to be a more cost-effective construction approach that may not be consistent with the DIMP's overall goal of reduction of risk on the system. Moreover, while it makes sense to group the riskiest adjacent segments into area projects, that infrastructure may not fall within a municipal neighborhood boundary. Replacing "neighborhoods" means including pipes for replacement that may not be as risky as other segments in a different neighborhood.

Q. How should the DIMP be used by the Company?

A. The DIMP should be used by the Company to reduce risk to its system to a manageable leak rate level and not to replace all of the pipe on the system as quickly as possible.

Bringing down the system risk to a manageable level will enhance customer safety and allow for more reasonable replacement costs on leak-prone infrastructure. The pace of replacements should then be adjusted in light of system performance. While this may result in longer replacement timelines for certain asset classes, focusing more resources on the worse performing segments will provide greater assurances of public safety. This observation is consistent with Mr. Coppola's recommendation number 9 regarding affordability from his testimony in this case:

> 9. A lower annual capital expenditure program for SMP that prioritizes replacement of the most vulnerable and risky mains and related infrastructure together with a longer implementation time horizon would make the cost of the program more affordable for customers.

Because the PGL will replace the riskiest pipe first under this approach, the Company will have more time to replace parts of the system under a neighborhood-type approach in the future. The Company may then take advantages of efficiencies by an area-wide approaches, but it should not be accelerating spending to achieve that goal at the expense of ensuring system safety.

Q. What do you mean by a "manageable" level of system risk?

A. Given the complexity of distribution systems and the varying nature of threats facing those components over time, no system could be made 100% risk free. However, risks can be reduced to an acceptable level given an appropriate level of resources deployed to manage all aspects of the system from operations and maintenance activities to capital replacement and expansion programs. For the leak-prone pipe targeted by the Company a "manageable" level would be considered leak rates that are decreased to levels that could be safely and efficiently remedied by the Company's repair crews kept on hand for this purpose before the implementation of the accelerated program. According to the Company, at no time since 2010 has its system been unsafe, unreliable or presented an unmanageable level of leaks, so that strongly suggests existing resources over that time period were appropriate.[72] The goal of the AMRP, after all, was to improve safety up to a

[72] PGL response to data request AG 11.18.

878 point that the increased resources brought to bear by the AMRP would no longer be
879 required.[73]
880
881 **Q. Will the Company incur lost sunk costs if it scales back its AMRP investment plans**
882 **for 2017 and future years?**
883 A. No. In response to a discovery question seeking to clarify this issue, PGL stated that
884 Peoples Gas has current Purchase Orders with construction contractors for work that has
885 begun or will begin in 2016 and will continue into 2017. Future work with each
886 contractor will be based on Requests for Proposals that will be issued at future dates. See
887 AG 6.06 Attach 01 for a list of the expected 2017 carryover projects."[74] In Attachment
888 02 to that response, PGL provided an excerpt from its Master Services Agreement,
889 including the provision governing PGL's rights to terminate for convenience. The
890 provision states that the "Company shall have the right on sixty (60) days written notice
891 to Contractor to terminate the Agreement for its convenience or at any time to terminate a
892 Purchase Order for its convenience." Following such exercise of termination rights, PGL
893 is generally required to pay the terminated contractor for work completed, but there are
894 no liquidated damages or other termination fees. I have attached the relevant documents
895 to my testimony as part of AG Exhibit 1.3.
896
897 **Q. Will there be any other benefits to a moderated approach to the SMP?**
898 A. Yes. The DIMP process is designed to be ongoing and tailored to system components
899 contributing to risk. Those risks will change over time, so a moderated approach is better
900 suited to DIMP requirements because it has the ability to smooth out the level of
901 investments over time while reducing risk, rather than become "lumpy" as will likely be
902 the case using the neighborhood approach. By "lumpy," I mean that punctuated bursts of
903 new infrastructure installment will all tend to reach the end of their useful lives at the
904 same time in the future, necessitating another crisis-like approach to system replacement
905 at that time. A smoother level of replacement, if justified by performance data, is better
906 since it will both avoid accelerated replacement and spending now, as well as in the

[73] Docket No. 09-0167, PGL Ex. SDM-1.0 at 2.
[74] PGL response to data request AG 6.06.

future when these now-new components are eventually replaced when they reach the end of their useful lives.

Q. Will removing the riskiest segments of pipe first assist with water-infiltration on the low pressure system?

A. Yes. By removing the leakiest segments of pipe first, the Company will tighten up its low pressure system and thereby reduce water infiltration at likely a lower cost than replacing an entire neighborhood of pipes to accomplish the same goal.

Q. If the DIMP does not require the use of "neighborhoods" is the Company's use of municipal boundaries nonetheless appropriate for area-wide replacements from an engineering perspective?

A. Not necessarily. If the goal is to replace the entirety of the distribution system, it would be an appropriate engineering strategy. However, the neighborhood approach does not maximize the reduction of risk on the Company's system and is inappropriate to that end. The Company used municipally-defined boundaries to define what it considers to be a neighborhood for purposes of its SMP program, but those boundaries will almost certainly not coincide with how the distribution system was originally laid out and engineered. A better approach to achieving benefits from an area-wide approach would to group similar materials across neighborhoods, rather than imposing what might amount to an arbitrary boundary from a system engineering perspective. The major driver for any area-wide replacement activity should be the reduction of risk rather than system build-up.

Q. What could the Company do to improve its program?

A. The Company should adopt a comprehensive system-wide, software-driven risk-ranking tool in order to score and rank the elements of its distribution system. The Company should then use the results of a robust ranking of its riskiest segments to reformulate its capital replacement program by focusing on the accelerated replacement of its worse performing segments first. As the Company works through its inventory of riskiest pipes, it should see a reduction in its leak rates.

Q. What type of capabilities should this software package have?

A. One example I am familiar with is Optimain DS. According to the software developer, Optimain DS incorporates numerous factors from GIS and other relational databases that allows users to define discrete projects based on various criteria:

> Optimain DS supports integration with all major GIS and relational database systems to collect main and service pipe attributes, leak and pipe condition reports, plus location specific information, such as cover type, building usage, population density, and other relevant factors. Users are able to define discrete project "envelopes" based on various criteria, including: default main configuration, leak concentrations, address ranges or user defined spatial envelopes. Optimain DS evaluates all Main and Service Pipe material types, including: Cast Iron/ Wrought Iron, Unprotected Steel, Protected Steel, and Plastic.[75]

Optimain DS also provides real-time updates as databases receive new information, allowing for real-time analysis of the condition of the system. The software also allows for customization to output system-wide pipe assessment. There is also a statistical analysis engine that can output reports and develop statistical forecast, risk, and likelihood values for the system. While Optimain is not the only such software tool that can accomplish these functions, any competing software solution should be benchmarked against these capabilities.

Q. Are you aware of any gas utilities that have used such a system in conjunction with accelerated infrastructure replacement programs?

A. Yes. For example, Washington Gas Light ("WGL") in Maryland uses the Optimain system and the Maryland Public Service Commission requires the filing of Optimain scores as part of the review of certain programs in WGL's accelerated infrastructure replacement plan.[76] The Maryland commission also requires that WGL focus on replacement of riskiest parts of its system: "we emphasize that while other factors are relevant, we expect the focus of WGL's Plan to target the most at-risk parts of its

[75] http://www.opvantek.com/index.php/products/optimain-suite/optimain-ds.
[76] *Washington Gas Light*, Case No. 9335, p. 73 (March 21, 2014) (proposed order).

distribution system in its STRIDE Plan, and we will monitor [WGL's] progress, particularly through the audit process."[77]

Q. Has the Company explored using new software tools for risk ranking its system?

A. Yes. According to the Company: [78]

> Peoples Gas recognizes that improvement is a continuous process and is currently investigating third party GIS software to display and analyze distribution integrity management plan (DIMP) data geographically. Peoples Gas has met with several vendors to review different software packages that are available and plans to utilize this software in the future.

Contact with the vendors started in October 2015 (Optimain), although the Company is still in the process of considering software packages.[79]

Q. Would you recommend that PGL expedite its process of enhancing its risk raking tools?

A. Yes, especially since the Company stated it planned to adopt this type of software almost a year ago but has not completed its vetting process. Since the use of a robust, properly configured, and properly implemented software-based tool will assist the Company in more narrowly focusing its capital program to target the riskiest segments of its system, the Company should no longer delay this process.

Q. How would you recommend the Company proceed?

A. PGL should issue an RFP to at least three commercial developers of software-based, system-wide risk assessment models for gas companies, score and select the models. The Company should complete the RFP process within 90 days of a Commission order in this proceeding. The Company should report its selection of software vendor and software package selected, along with a timeline for full implementation, to the Commission. The Commission should ensure that the RFP process was robust, fair,

[77] *Washington Gas Light*, Case No. 9335, p. 20 (May 6, 2014) (Order 86321).
[78] PGL response to data request AG 4.17.
[79] PGL response to data request AG 11.03.

transparent process and that the Company appropriately scored and selected the software package that has the best capabilities to help PGL achieve system risk reduction in a least cost manner. The ICC's review should also ensure that the Company plans to appropriately configure and utilize the software in its capital replacement planning process. Full implementation of the new package should take place within 180 days of selection of the vendor.

C. Unit of Property Classification Should Not Unnecessarily Increase Program Costs

Q. What is a unit of property classification?

A. When a company does work on its system, expenditures are classified as either an Operations & Maintenance ("O&M") expense or capitalized cost, and these classifications have specific rules. For example, when asked about the classification criteria for main and services the Company responded:[80]

> Specifically, for mains and service segments, the "50 foot rule" applies: if 50 feet or less of pipe is replaced then it is expensed on all like-type and -size replacements for gas mains and services. If it is not a replacement of like-type or -size pipe or it is new for the first time, it is capitalized down to the 1st foot. Services are tracked by footage and not by unit.

Q. Why would this rule cause you any concern as it relates to capital programs?

A. Because by modifying the unit of property classification criteria (*i.e.*, the length of pipe that is considered a capital investment instead of an O&M expense), a company can shift cost between O&M and capital costs to direct more or less of one type of costs towards base rates or a special capital tracking mechanism, like Rider QIP.

Q. Can you provide an example?

A. Yes. Assume in the test year from its last rate case a company classified pipe work for lengths of 50 feet as an O&M expense and that level of expense was included in base rates collected from customers. If, during a year the Rider QIP eligible program is running, the company decides to follow a different standard and to capitalize pipe

[80] PGL response to data request AG 11.07.

expenditures for length of 10 feet or more, then O&M expense will drop but capitalized costs under the Rider QIP eligible program will rise, as will the Rider QIP surcharge. Base rates, however, will not be reduced to reflect the lower levels of costs classified as O&M because base rates remain fixed between rate cases. In addition, the newly classified "capital" expenditures will earn a return under the Rider QIP, where no return would be earned when those costs were classified as an O&M expense in base rates. Note that no additional resources would have devoted to reducing system risk or plant-in-service replaced, but Rider QIP costs will rise, creating the appearance that more dollars are being dedicated to implementing a programs to removing leak prone pipe, for example, when, in fact, the total dollars spent between base rates and the special program could remain the same.

Q. Do you believe this would be a problem under the SMP?

A. Potentially. Although the Company provided its unit of property accounting criteria used in the last rate case in discovery, the Company refused to state what rules it would use for cost classification purposes in the future for the SMP or AMRP.[81]

Q. What do you recommend?

A. The Company should be required to use the same criteria for unit of property classification for SMP cost accounting as it used in the test year of its last base rate case. Without an accounting standard it would be possible for the Company to shift work that is classified as O&M in the test year of its last rate case into a capital expenditure under the SMP simply by changing the accounting criteria for a unit of property. Any approval of the SMP should be conditioned on PGL using the same criteria for unit of property classification for SMP cost accounting as the used in the test year of its last rate case. A utility should not be permitted to collect dollars for work once as represented in base rates as an O&M expense, and also for the same type of work as a capital cost (plus a return) under the Rider QIP, or use the unit of property rules to otherwise increase

[81] PGL response to data request AG 11.08.

program costs when there has been no increase in plant-in-service and / or increase in O&M activity.

V. CONCLUSION

Q. What do you conclude based on your review of the Company's AMRP?

A. The Commission should require the recommendations described at pages 3-5 of my testimony.

Q. How do you anticipate those recommendations working together?

A. Essentially, given the system performance under the current approach to capital replacement:

1) The current SMP should be rejected;

2) The Company should implement a comprehensive software driven risk analysis tool and rank all of its pipe segments against each other according to risk;

3) The Company should reformulate its capital plan to target the worse segments first with increased levels of resources using the new risk rankings; and

4) The Company should resubmit this revised proposed capital program as a compliance filing.

The details of my recommendations are explained throughout my testimony, but the revised plan should be designed to achieve lower levels of leak-driven system risk with lower annual costs than those costs anticipated under the SMP and the "neighborhood replacement" approach.

Q. Does that conclude your testimony?

A. Yes, it does, however, I may amend my testimony based on any new information provided by the Company in pending data requests.